NEW CLAIMS

I claim:

69. A method for a peripheral device of a computer system to monitor at least one mobility context and response to said mobility context change, the method comprising:

receiving one or more instructions to specify at least one trigger condition;

storing said trigger condition in a said device;

monitoring current state of said mobility context;

evaluating trigger condition with said current state; and

outputting a signal if said current state satisfies the criteria of said trigger condition.

70. The method of claim 69, wherein said signal wakes up the host system of said computer system from power saving mode.

71. The method of claim 69, wherein said signal interrupts the host system of said computer system for executing a job that is associated with said trigger condition

72. The method of claim 69, further comprising:

associating a callback identifier with said trigger condition;

storing said callback identifier; and

outputting said callback identifier if said current state satisfies the criteria of said trigger condition.

73. The method of claim 69, further comprising specifying the second trigger condition, wherein the first said trigger condition can be enable or disable when said current state satisfies the criteria of said second trigger condition.

74. The method of claim 69, wherein said mobility context is selected from the following group consisting of location context and proximity context.

75. The method of claim 74, wherein said location context is the position of said device in a referencing position system.

76. The method of claim 75, wherein said referencing position system is Global Positioning System (GPS) referencing position system.

77. The method of claim 75, wherein said monitoring current state further comprising determining the current position of said device by triangulation method.

78. The method of claim 75, wherein said trigger condition is an area in said referencing position system and said trigger condition is satisfied if the current position of said device falls in said area.

79. The method of claim 74, wherein said proximity context is the presence of one or more wireless communication interfaces in proximity of said device.

80. The method of claim 79, wherein said monitoring current state further comprising:

receiving message on wireless media; and

decoding said message according to a communication protocol, wherein a wireless communication interface becomes present in proximity of said device if the identifier of this wireless communication interface is decoded from said message.

81. The method of claim 80, wherein said trigger condition is a rule of presence of one or more trigger identifiers that designate certain specific wireless communication interfaces in proximity of said device.

82. The method of claim 81, further comprising recording the last receiving time of said trigger identifier, wherein said last receiving time further determines the absence of said trigger identifier.

83. The method of claim 81, wherein said protocol includes a media access control sub layer protocol and said trigger identifier is an identifier used by said media access control sub layer protocol.

84. The method of claim 83, wherein said trigger identifier is a media access control address.

85. The method of claim 81, wherein said protocol includes Internet protocol layer and said trigger identifier is an identifier used by said Internet protocol layer.

86. The method of claim 85, wherein said trigger identifier is an Internet protocol (IP) address.

87. A peripheral device of a computing system to monitor at least one mobility context and response to a mobility context change comprising:

at least one receiver for receiving information related to the current state of said mobility context;

at least one trigger condition that defines a trigger state of said mobility context;

a memory for storing said trigger condition; and

a checker configured to evaluate said trigger condition and output a signal when said current state meet the criteria of said trigger condition;

88. The device of claim 87, wherein said signal wakes up a host system from power saving mode.

89. The device of claim 87, further comprising an interface controller coupled to a host system, wherein said host system send said trigger condition to said device through said interface controller.

90. The device of claim 87, wherein said signal interrupts the host system of said computer system for executing a job that is associated with said trigger condition.

91. The device of claim 87, further comprising a callback identifier that associates with said trigger condition, wherein said callback identifier is stored in said device and is transmitted to said host system when said trigger condition is satisfied.

92. The device of claim 87, further comprising the second trigger condition, wherein the first said trigger condition can be enable or disable when said current state satisfies the criteria of said second trigger condition.

93. The device of claim 87, wherein said mobility context is selected from the following group consisting of location context and proximity context.

94. The device of claim 93, wherein said location context is the position of said device in a referencing position system.

95. The device of claim 94, wherein said referencing position system is Global Positioning System (GPS) referencing position system.

96. The device of claim 94, wherein said trigger condition is an area in said referencing position system and said trigger condition is satisfied if the current position of said device falls in said area.

97. The device of claim 94,wherein said receiver contains a processor configured to determine the current position of said device by triangulation method.

98. The device of claim 93, wherein said proximity context is the presence of one or more wireless communication interfaces in proximity of said device.

99. The device of claim 98, wherein said receiver contains a processor configured to decoding message on wireless media according to a communication protocol, wherein a wireless communication interface becomes present in proximity of said device if the identifier of this wireless communication interface is decoded from said message;

100. The device of claim 99, wherein said trigger condition is a rule of presence of one or more trigger identifiers that designate certain specific wireless communication interfaces in proximity of said device.

101. The device of claim 100, further comprising means to record the last receiving time of said trigger identifier, wherein said last receiving time further determines the absence of said trigger identifier.

102. The method of claim 100, wherein said protocol includes a media access control sub layer protocol and said trigger identifier is an identifier used by said media access control sub layer protocol.

103. The device of claim 102, wherein said trigger identifier is a media access control address.

104. The method of claim 100, wherein said protocol includes Internet protocol layer and said trigger identifier is an identifier used by said Internet protocol layer.

105. The method of claim 104, wherein said trigger identifier is an Internet protocol (IP) address.

106. A method for receiving an identifier for using as a trigger identifier in a trigger condition to trigger a job execution comprising:

receiving by a wireless communication interface a data packet and the transmitter address field and the receiver address field of said data packet contain the same identifier that designates to another wireless communication interface in proximity;

decoding said identifier from said data packet; and

storing said identifier.

107. The method of claim 106, further comprising:

receiving an instruction; and

giving a time delay tolerance, wherein said identifier is selected as trigger identifier only if the time difference between receiving said identifier and receiving said instruction is within said time delay tolerance.

FIG.5 shows a method for saving the power of mobility aware system 0100, according to some embodiments of the present invention.

Description

As used herein, a context triggered job (hereafter "job") refers to one or group of tasks for which a context aware application schedules to execute when a computer-processing device (hereafter "computing device") detects a trigger state of context. The job, for example, includes sending out a remind message, sending/receiving e-mail, downloading information, sending out control instruction to other devices, such as computers or appliances, etc.

THE SYSTEM

FIG. 1 illustrates an example of said computing device 0100 (hereafter "System") for storing, retrieving, and executing said jobs relating to one or more trigger states of mobility context in accordance with some embodiments of the present invention. The System 0100 is generally implemented using any conventional general-purpose computer having conventional computer components, including at least one processor 0101, program memory 0102, one or more input devices 0103, one or more output devices 0104, at least one mobility context receiving device (MCRD) 0105. In some embodiments, MCRD 0105 is an integrated build-in module in System 0100. In some embodiments, the MCRD 0105 is an add-on card that connects to the system bus 0109 of the System 0100 via a bus controller, for example PCMICA controller; in yet another

embodiment, the MCRD 0105 is a stand-alone adapter that is connected to the System 0100 via an I/O port, for example an USB port. The input device may includes mouse, keyboard, touch sensitive screen, or voice recognition module. The output device may include monitor, screen, or speaker module. Processor 0101, program memory 0102, system bus 0109, and bus controller are usually considered as host system 0120 and others are peripherals. In some embodiments, System 0100 is a mobile computing device, such as a personal digital assistant (PDA), a mobile telephone or a portable computer, that may omit one or more components found in conventional general-purpose computers, e.g., hard drive 0107 and keyboard. A context aware application program (hereafter "application") 0108 is generally executed in any conventional operating system, such as Windows Pocket PC, manufactured by Microsoft Corporation of Redmond, and Palm, manufactured by Palm, Inc., of Santa Clara, California. Application program 0108 is generally programmed in any conventional general-purpose programming language, such as Java, C, and C++, any combination of general-purpose programming languages, or any combination of a general-purpose programming language and a more specialized programming language, such as a scripting language (Perl). In general, any computing device capable of communicating information to another computing device may be used in various embodiments of the present invention.

MOBILITY CONTEXT

Said mobility context includes location context and proximity context. The location context is the location of the system of the present invention in a referencing position system. The proximity context is the proximity relation between the system of the present invention and other objects or systems